HEPATITIS, UNSPECIFIED *(infectious)*

DISEASE REPORTING

In Washington

New requirements for the reporting of unspecified, infectious hepatitis were instituted in December of 2000. In the first year of reporting, DOH received 0 reports.

Hepatitis D (delta) virus and hepatitis E virus infections should be reported to DOH as unspecified infectious hepatitis.

An outbreak of hepatitis B among injecting drug users (IDUs) in Pierce County in April 2000 included 60 cases and resulted in three deaths among IDUs co-infected with hepatitis delta virus.

Purpose of reporting and surveillance

- To better characterize the epidemiology of infectious hepatitis not due to hepatitis A, B, or C.
- To recommend appropriate preventive measures, including immunization against other types of hepatitis which are vaccine-preventable.

Reporting requirements

- Health care providers: **immediately notifiable to Local Health Jurisdiction**
- Hospitals: **immediately notifiable to Local Health Jurisdiction**
- Laboratories: no requirements for reporting
- Local health jurisdictions: notifiable to DOH Communicable Disease Epidemiology within 7 days of case investigation completion or summary information required within 21 days

CASE DEFINITION FOR SURVEILLANCE

Clinical criteria for diagnosis

An illness with a) discrete onset of symptoms and , b) jaundice or elevated serum aminotransferase levels.

Laboratory criteria for diagnosis

- Serum aminotransferase levels > 2 ½ times the upper limit of normal, and
- Immunoglobulin M (IgM) anti-HAV negative, and
- IgM anti-HBc negative (if done) or HbsAg negative, and

- Anti-HCV negative
- For hepatitis D: HBsAg or IgM anti-HBc positive and antibody to hepatitis D virus positive.

Case definition

- Confirmed: A case that meets the clinical case definition and is laboratory confirmed.

A. DESCRIPTION

1. Identification

Onset is usually abrupt, with signs and symptoms resembling those of hepatitis B; may be severe and is always associated with a coexistent hepatitis B virus infection. Delta hepatitis may be self-limiting or it may progress to chronic hepatitis. Children may have a particularly severe clinical course with usual progression to chronic active hepatitis. Hepatitis delta virus (HDV) and hepatitis B virus (HBV) may coinfect, or delta virus infection may occur in persons with chronic HBV infection. In the latter case, delta hepatitis can be misdiagnosed as an exacerbation of chronic hepatitis B. In several studies throughout Europe and the US, 25%-50% of fulminant hepatitis cases thought to be caused by HBV were associated with concurrent infection with HDV. The most fulminant disease occurs in superinfections rather than coinfections; a chronic outcome is more commonly associated with superinfection.

Diagnosis is made by detection of total antibody to HDV (anti-HDV) by RIA or EIA. A positive IgM titer indicates ongoing replication; reverse transcription PCR is the most sensitive assay for detecting HDV viremia.

2. Infectious Agent

HDV is a 35-37-nm virus-like particle consisting of a coat of HBsAg and a unique internal antigen, the delta antigen. Encapsulated with the delta antigen is the genome, a single-stranded RNA that can have a linear or circular conformation. The RNA does not hybridize with HBV DNA. HDV is unable to infect a cell by itself and requires coinfection with the HBV to undergo a complete replication cycle. Synthesis of HDV, in turn, results in temporary suppression of synthesis of HBV components. HDV is best considered in the new “satellite” family of subvirions, some of which are pathogens of higher plants. Hepatitis D is the only agent in this family that infects animal species. Three genotypes of HDV have been identified: Genotype I is the most prevalent and widespread, Genotype II is represented by two isolates from Japan and Taiwan and Genotype III has been found only in the Amazon basin, where it causes severe fulminant hepatitis with microvesicular steatosis (spongiocytosis).

3. Worldwide Occurrence

Worldwide, but its prevalence varies widely. An estimated 10 million people are infected with hepatitis D virus and its helper virus HBV. It occurs epidemically or endemically in populations at high risk of HBV infection, such as populations in which hepatitis B is endemic (highest in parts of Russia, Romania, southern Italy, Africa and South America); in hemophiliacs, drug addicts and others who come in frequent contact with blood; in institutions for the developmentally disabled; and, to a lesser extent, in male homosexuals. Severe epidemics have been observed in tropical South America (Brazil, Venezuela, Colombia), in the Central African Republic and among drug addicts in Worcester, Massachusetts (US).

4. Reservoir

Humans. Virus can be transmitted experimentally to chimpanzees and to woodchucks that are infected with HBV and woodchuck hepatitis virus, respectively.

5. Mode of Transmission

Thought to be similar to that of HBV-by exposure to infected blood and serous body fluids, contaminated needles, syringes and plasma derivatives such as antihemophilic factor, and through sexual transmission.

6. Incubation period

Approximately 2-8 weeks.

7. Period of communicability

Blood is potentially infectious during all phases of active delta hepatitis infection. Peak infectivity probably occurs just prior to onset of acute illness, when particles containing the delta antigen are readily detected in the blood. Following onset, viremia probably falls rapidly to low or undetectable levels. HDV has been transmitted to chimpanzees from the blood of chronically infected patients in which particles containing delta antigen could not be detected.

8. Susceptibility and resistance

All people susceptible to HBV infection or who have chronic HBV can be infected with HDV. Severe disease can occur even in children.

B. METHODS OF CONTROL

1. Preventive measures:

For people susceptible to HBV infection, same as for hepatitis B. Prevention of HBV infection with hepatitis B vaccine prevents infection with HDV. Among persons with chronic HBV, the only effective measure is avoidance of exposure to any potential source of HDV. HBIG, IG and hepatitis B vaccine do not protect persons with chronic HBV from infection by HDV. Studies reported from Taiwan suggest that measures which decrease sexual exposure and needle sharing have been associated with a decline in the incidence of HDV infection.

2. Control of patient, contacts and the immediate environment:

Same as for Hepatitis B.

3. Epidemic measures

When two or more cases occur in association with some common exposure, conduct a search for additional cases. Institute strict aseptic techniques. If a plasma derivative such as antihemophilic factor, fibrinogen, pooled plasma or thrombin is implicated, withdraw the lot from use and trace all recipients of the same lot in a search for additional cases.

4. International measures

None.

VIRAL HEPATITIS E

A. DESCRIPTION

1. Identification

The clinical course is similar to that of hepatitis A; there is no evidence of a chronic form. The case-fatality rate is similar to that of hepatitis A except in pregnant women, where the rate may reach 20% among those infected during the third trimester of pregnancy. Epidemic and sporadic cases have been described.

Diagnosis depends on clinical and epidemiologic features and exclusion of other etiologies of hepatitis, especially hepatitis A, by serologic means. Serologic tests have been developed for antibody to HEV, but are not commercially available in the US. However, several diagnostic tests are available in research laboratories, which include: enzyme immunoassays and Western blot assays to detect IgM and immunoglobulin G (IgG) anti-HEV in serum; polymerase chain reaction tests to detect HEV RNA in serum and stool, and immunofluorescent antibody blocking assays to detect antibody to HEV antigen in serum and liver.

2. Infectious Agent

The hepatitis E virus (HEV), a spherical, nonenveloped, single-stranded RNA virus that is approximately 32 to 34 nm in diameter. HEV has been provisionally classified in the Caliciviridae family. However, the organization of the HEV genome is substantially different from other caliciviruses, and HEV may eventually be classified in a separate family.

3. Worldwide Occurrence

HEV is the major etiologic agent of enterically transmitted non-A, non-B hepatitis throughout the world. Outbreaks of hepatitis E and sporadic cases have occurred over a wide geographic area, primarily in countries with inadequate environmental sanitation. Outbreaks often occur as waterborne epidemics, but sporadic cases and epidemics not clearly related to water have been reported. The highest rates of clinically evident disease have been in young to middle aged adults; lower disease rates in younger age groups may be the result of anicteric and/or subclinical HEV infection. In the US and most other industrialized countries, hepatitis E cases have been documented only among travelers returning from HEV endemic areas. Outbreaks have been identified in India, Myanmar (Burma), Iran, Bangladesh, Ethiopia, Nepal, Pakistan, central Asian Republics of the former Soviet Union, Algeria, Libya, Somalia, Mexico, Indonesia and China. A large waterborne outbreak consisting of 3,682 cases occurred in 1993 in Uttar Pradesh.

4. Reservoir

Recent studies suggest a reservoir may exist in domestic animals, including swine; however, this has not been proved. HEV is transmissible to chimpanzees, cynomolgus macaques, tamarins and pigs.

5. Mode of Transmission

HEV is transmitted primarily by the fecal-oral route; fecally contaminated drinking water is the most commonly documented vehicle of transmission. Transmission probably also occurs from person to person by the fecal-oral route, though secondary household cases are not common during outbreaks. Recent studies have suggested that hepatitis E may in fact be a zoonotic infection with coincident areas of high human infection.

6. Incubation period

The range is 15 to 64 days; the mean incubation period has varied from 26 to 42 days in different epidemics.

7. Period of communicability

Not known. However, HEV has been detected in stools 14 days after the onset of jaundice and approximately 4 weeks after oral ingestion of contaminated food or water and persists for about 2 weeks.

8. Susceptibility and resistance

Susceptibility is unknown. More than 50% of HEV infections may be anicteric; the expression of icterus appears to increase with increasing age. Women in the third trimester of pregnancy are especially susceptible to fulminant disease. The occurrence of major epidemics among young adults in geographic regions where other enteric viruses are highly endemic and most of the population acquires infection in infancy remains unexplained.

B. METHODS OF CONTROL

1. Preventive measures:

Provide educational programs to stress sanitary disposal of feces and careful handwashing after defecation and before handling food; follow basic measures to prevent fecal-oral transmission, as listed under TYPHOID FEVER, B1. It is unlikely that IG prepared from the serum of donors in the US or Europe will protect against hepatitis E.

2. Control of patient, contacts and the immediate environment:

a. Report to local health authority,
b. Isolation: For proven hepatitis E, enteric precautions during the first 2 weeks of illness, but no more than 1 week after onset of jaundice; the exception is an outbreak in the neonatal intensive care setting, where prolonged enteric precautions should be considered.
c. Concurrent disinfection: Sanitary disposal of feces, urine and blood.
d. Quarantine: None.
e. Immunization of contacts: No products are available to prevent hepatitis E. IG prepared from plasma collected in non-HEV endemic areas is not effective in preventing clinical disease during hepatitis E outbreaks, and the efficacy of IG prepared from plasma collected in HEV endemic areas is unclear. In studies conducted with prototype vaccines in animals, vaccine induced antibody attenuated HEV infection but did not prevent virus excretion in stools.
f. Investigation of contacts and source of infection: Search for missed cases and maintain surveillance of contacts in the patient's household or, in a common source outbreak, people exposed to the same risk.
g. Specific treatment: None.

3. Epidemic measures

Determine mode of transmission by epidemiologic investigation; investigate water supply and identify the population at increased risk of infection. Make special efforts to improve sanitary and hygienic practices in order to eliminate fecal contamination of foods and water.

4. International measures

None.